Claims

1. A rare earth oxide superconductor, wherein an intermediate layer comprising a cerium oxide obtained by adding 5 to 90 mol%, in terms of the metal content, of one or two or more elements selected from rare earth elements Re (Re represents any one of elements of Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La and Er) to cerium is formed on a surface of a metal substrate, and a rare earth oxide superconducting layer is formed on the intermediate layer.

2. The rare earth oxide superconductor according to Claim 1, wherein the added amount of the rare earth element Re in the intermediate layer is 20 to 60 mol%, in terms of the metal content.

3. The rare earth oxide superconductor according to Claim 1 or 2, wherein the intermediate layer is formed by MOD method or PLD method.

4. The rare earth oxide superconductor according to any one of Claims 1 to 3, wherein the metal substrate is a biaxially textured metal substrate.

5. The rare earth oxide superconductor according to any one of Claims 1 to 4, wherein the rare earth oxide superconducting layer is directly formed on the intermediate layer.

6. A process for producing a rare earth oxide superconductor, comprising applying a mixture obtained by mixing 5 to 90 mol%, in terms of the metal content, of one or two or more elements selected from rare earth elements Re (Re represents any one of elements of

Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La and Er) with cerium to a surface of a metal substrate by a liquid phase process and performing calcination at a temperature of 900°C or higher and lower than 1200°C under a reduced pressure of 0.1 Pa or higher and lower than atmospheric pressure to form an intermediate layer comprising a cerium oxide, and then forming a rare earth oxide superconducting layer on the intermediate layer.

7. The process for producing a rare earth oxide superconductor according to Claim 6, wherein the content of the rare earth element Re in the mixture is 20 to 60 mol%, in terms of the metal content.

8. The process for producing a rare earth oxide superconductor according to Claim 6 or 7, wherein the application of the mixture is performed by MOD method.

9. The process for producing a rare earth oxide superconductor according to any one of Claims 6 to 8, wherein the intermediate layer is formed by calcination under a pressure ranging from 50 to 500 Pa.

10. The process for producing a rare earth oxide superconductor according to any one of Claims 6 to 9, wherein the intermediate layer is formed by calcination at a temperature ranging from 950 to 1150°C.

11. The process for producing a rare earth oxide superconductor according to any one of Claims 6 to 10, wherein the metal substrate is a biaxially textured metal substrate.

12. The process for producing a rare earth oxide superconductor according to any one of Claims 6 to 11, wherein the rare earth oxide

superconducting layer is directly formed on the intermediate layer.

13. A process for producing a rare earth oxide superconductor, comprising applying a mixture obtained by mixing 20 to 60 mol%, in terms of the metal content, of one or two or more elements selected from rare earth elements Re (Re represents any one of elements of Y, Nd, Sm, Gd, Eu, Yb, Ho, Tm, Dy, La and Er) with cerium to a surface of a biaxially textured metal substrate by MOD method, and performing calcination in a reducing gas atmosphere in which 0.1 to 10% of H_2 is added to an Ar and N_2 gas mixture at a temperature ranging from 950 to 1150°C under a pressure ranging from 50 to 500 Pa to form an intermediate layer comprising a cerium oxide, and then forming a rare earth oxide superconducting layer on the intermediate layer.